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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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QUALCOMM INCORPORATED
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EXAMINER	
HALIYUR, VENKATESH N	

ART UNIT	PAPER NUMBER
2476	

NOTIFICATION DATE	DELIVERY MODE
01/06/2010	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/693,169	WALLACE ET AL.	
	Examiner	Art Unit	
	VENKATESH HALIYUR	2476	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12/08/2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-42 (claims 26,28,34 are canceled)* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-25,27,29-32,35-38 and 40-42* is/are rejected.

7)☒ Claim(s) *33 and 39* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. The amendment filed on 12/08/2009 has been fully considered. Rejection follows.

2. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 12/08/2009 has been entered.

3. Claims 1-42 are pending in the application. Claims 26, 28, 34, are canceled.

Claim Rejections – 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1-24, 29-32, 35-38, 40-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boros et al [US Pat: 6,654,590] and Tellado et al [US 2004/0198276] and Hudson [US Pat: 7,254,171] further in view of Keskitalo et al. [US Pat: 7,403,748].

Regarding claims 1,18, Boros et al in the invention of "Determining a Calibration Function Using at Least One Remote Terminal" disclosed a method for establishing peer-to-peer communications between a first subscriber unit and a second subscriber unit in a wireless communication system including an access point **(base station)**, a first subscriber set and a second subscriber set **(Figs 4-7, col 13, lines 47-65)**, comprising: obtaining estimates of downlink channel responses for each of the first subscriber set and the second subscriber set **(col 20, lines 55-58)**; obtaining estimates of uplink channel responses for each of the first subscriber set and the second subscriber set **(col 20, lines 49-54)**; determining for each of the first subscriber set and the second subscriber set first **(uplink weight vectors)** and second **(downlink weight vectors)** sets of correction factors **(weighted vectors)** based on the estimates of the downlink and uplink channel responses **(col 14, lines 30-60);** calibrating a downlink channel and uplink channel for the first subscriber and second subscriber sets based on each of the first and second sets of correction factors **(using uplink and downlink spatial signatures, col 20, lines 40-58, Fig 7)**, respectively, to form a calibrated downlink channel and a calibrated uplink channel usable between the first subscriber set and the second subscriber set using weighted average calibration vector **(average calibration vector, col 14, lines 35-60, col 19, lines 46-67),** but Boros et al fails to disclose that establishing a direct peer-to-peer communication between the first

subscriber set and the second subscriber set without further calibration between them. However, Tellado et al in the invention of "Multiple Channel Wireless Receiver" disclosed a method for multiple transmit/receive pairs that establishes communication **(calibrate channel by determining noise and distortion reference statistics performed over a plurality of time intervals, para 0026-0032, 0080-0081)** between first and second sets of nodes in a wireless communication system without performing further calibration on the transmit and receive channels of the subscriber sets **(for wireless communications between at least two devices para 0043-0046, Figs 3-4)**. Therefore it would have been obvious for one of ordinary skill in the art at the time the invention was made to include the method of establishing peer-to-peer communication between first and second sets of nodes in a wireless communication system as taught by Tellado et al in the system of Boros et al for establishing communication between first and second sets of nodes in a wireless communication. But, both Boros et al and Tellado et al fails to positively disclose the feature of establishing a peer-to-peer between first and second sets in a wireless communication system without performing on calibration on the transmit and receive channels of the subscriber sets. However, Hudson et al in the invention of “Equalizer for Digital Communications Systems and Method of Equalization” disclosed a method for calibrating a peer-to-peer communication channel using MMSE equalized packet spectrum ratio between the first and second subscriber stations **(items 620 and 608 of Fig 6, col 10, lines 55-67, col 19, lines 17-42, Fig 6).** Therefore it would have been obvious for one of ordinary skill in the art at the time the invention was made to include the method of applying MMSE

equalized packet spectrum ratio to establish a peer-to-peer communication between first and second sets in a wireless communication system as taught by Hudson in the system of Boros et al as modified by Tellado for establishing a peer-to-peer communication between the first and second subscriber sets in a wireless communication system.

Boros et al, Tellado and Hudson however fail to positively disclose the feature that the communication between the first and second sets of nodes in a wireless communication system is maintained without performing further calibration on the transmit and receive channels of the subscriber sets. However Keskitalo et al disclosed that the communication between the mobile stations **(Figs 6/7)** can be maintained without performing further calibration on the transmit and receive channels **(col 4, lines 59-67, col 5, lines 1-19)**. Therefore it would have been obvious for one of ordinary skill in the art at the time the invention was made to include the method of applying MMSE equalized packet spectrum ratio to establish a peer-to-peer communication between first and second sets in a wireless communication system as taught by Keskitalo in the system of Boros et al as modified by Tellado and Hudson for establishing a peer-to-peer communication between the first and second subscriber sets in a wireless communication system without performing further calibration on the transmit and receive channels of the subscriber sets. One is motivated as such in order to use the method of peer-to-peer communication to optimize capacity to provide two-way communication between wireless nodes or adjacent cells in wireless network.

Regarding claims 2, 22-23, Boros et al disclosed that the first set of correction factors **(uplink weight vectors)** is used to scale symbols prior **(pre-processing)** to transmission on the calibrated downlink channel **(col 19, lines 7-15)** and the second set of correction factors is used to scale symbols prior to transmission on the calibrated uplink channel **(col 17, lines 24-42)**.

Regarding claim 3, Boros et al disclosed that the first set of correction factors **(uplink weight vectors)** is used to scale symbols received on the calibrated downlink channel **(col 19, lines 1-6)** and the second set of correction factors **(downlink weight vectors)** is used to scale symbols received on the calibrated uplink channel **(col 17, lines 43-50)**

Regarding claim 4, Boros et al disclosed that the first and second sets of correction are determined based on the following equation: H_{dn} is a matrix for the estimate of the downlink channel response, H_{up} is a matrix for the estimate of the uplink channel response, K_{ap} is a matrix for the first set of correction factors, K_{ut} is a matrix for the second set of correction factors, and T denotes a transpose **(col 19, lines 13-33).**

Regarding claims 5-7,20-21, Boros et al disclosed determining the first and second sets of correction factors includes: computing a matrix C as an element-wise ratio of the matrix H_{up} over matrix H_{dn}, and deriving the matrices K_{ap} and K_{ut} based on the matrix C and the deriving the matrix K_{ut} includes normalizing each of a plurality of rows of the matrix C **(col 24, lines 46-67)** and determining a mean of the plurality of normalized rows of the matrix C, and wherein the matrix K_{ut} is formed based on the mean of the plurality of normalized rows and deriving the matrix K_{ap} includes

normalizing each of a plurality of columns of the matrix C, and determining a mean of inverses of the plurality of normalized columns of the matrix C **(col 25, lines 1-67)** and wherein the matrix K_{ap} is formed based on the mean of the inverses of the plurality of normalized columns **(col 29, lines 24-64)**.

Regarding claims 8-9, 19, Boros et al disclosed wherein the matrices and the first and second set of corrections factors are determined based on a minimum mean square error computation **(col 14, lines 64-67, col 15, lines 1-30).** Tellado disclosed performing the calibration of the channel based on the previous calibration values to compute the error **(para 0081)** but fails to disclose MMSE computation minimizes a mean square error. However, Hudson disclosed a method for using MMSE spatial ratio to minimize the means square error **(col 10, lines 55-67).** Therefore it would have been obvious for one of ordinary skill in the art at the time the invention was made to include the method of MMSE computation to minimize a mean square error as taught by Hudson in the system of Boros et al as modified by Tellado, Hudson, Keskitalo wherein the matrices and the first and second set of corrections factors are determined based on MMSE computation to minimize a mean square error. One is motivated as such in order to use MMSE computation to minimize a mean square error for peer-to-peer communication in a wireless network.

Regarding claims 10-12, Boros et al disclosed determining a scaling value indicative of an average difference between the estimate of the downlink channel response and the estimate of the uplink channel response **(col 14, lines 49-60)** and wherein the estimates for the downlink and uplink channel responses are normalized to

account for receiver noise floor **(SINR)** and wherein the determining is performed at a user terminal **(col 25, lines 14-46).**

Regarding claim 13, Boros et al disclosed wherein a first set of matrices of correction factors for the downlink channel is determined for a first set of subbands **(uplink subarray)** and interpolating the first set of matrices to obtain a second set of matrices of correction factors for the downlink channel for a second set of subbands **(downlink subarray, col 21, lines 9-35, col 29, lines 5-22)**.

Regarding claim 14, Boros et al disclosed that the estimates of the downlink and uplink channel responses are each obtained based on a pilot transmitted from a plurality of antennas and orthogonalized with a plurality of orthogonal sequences **(col 25, lines 49-67).**

Regarding claim 15, Boros et al disclosed that the estimate of the uplink channel response is obtained based on a pilot transmitted **(paging)** on the uplink channel and wherein the estimate of the downlink channel response is obtained based on a pilot transmitted on the downlink channel **(col 20, lines 40-58).**

Regarding claims 16-17, Boros et al disclosed that the TDD system is a multiple-input multiple-output **(multiple transmit/receive antenna arrays)** system and wherein the TDD system utilizes orthogonal frequency division multiplexing **(col 12, lines 47-67).**

Regarding claims 24,40, Boros et al disclosed an apparatus **(Fig 1)** in a wireless time division duplexed(TDD) multiple-input multiple-output(MIMO) communication system: means for obtaining **(Figs 4-7, col 13, lines 47-65)** estimates of downlink

channel responses for each of the first subscriber set **(item 141 of Fig 1)** and the second subscriber set **(item 143 of Fig 1, col 20, lines 55-58)**; means for obtaining estimates of uplink channel responses for each of the first subscriber set and the second subscriber set **(col 20, lines 49-54)**; means for determining for each of the first subscriber set and the second subscriber set first **(uplink weight vectors)** and second **(downlink weight vectors)** sets of correction factors **(weighted vectors)** based on the estimates of the downlink and uplink channel responses **(col 14, lines 30-60),** wherein a calibrated the downlink channel for peer-to-peer communication between the first subscriber and second subscriber sets based is formed by using the first set of correction factors for the downlink channel and a calibrated uplink channel for peer-to-peer communication between the first and second subscriber sets if formed by using the second set of correction factors for the uplink channel; **(using uplink and downlink spatial signatures, col 20, lines 40-58, Fig 7)**, and means for establishing communication between the first subscriber set and the second subscriber using weighted average calibration vector **(average calibration vector ,col 14, lines 35-60, col 19, lines 46-67),** but Boros et al fails to disclose establishing direct peer-to-peer communication between the first subscriber set and the second subscriber set the first without further calibration between them. However, Tellado et al disclosed a method for multiple transmit/receive pairs that establishes communication **(calibrate channel by determining noise and distortion reference statistics performed over a plurality of time intervals, para 0026-0032, 0080-0081)** between first and second sets of nodes in a wireless communication system without performing further calibration on the transmit

and receive channels of the subscriber sets **(wireless communications between at least two devices para 0043-0046, Figs 3-4)**. Therefore it would have been obvious for one of ordinary skill in the art at the time the invention was made to include the method of establishing peer-to-peer communication between first and second sets of nodes in a wireless communication system as taught by Tellado et al in the system of Boros et al for establishing communication between first and second sets of nodes in a wireless communication system without performing on calibration on the transmit and receive channels of the subscriber sets. But, both Boros et al and Tellado et al fails to positively disclose the feature of establishing a peer-to-peer between first and second sets in a wireless communication system. However, Hudson et al disclosed a method for calibrating a peer-to-peer communication channel using MMSE equalized packet spectrum ratio between the first and second subscriber stations **(items 620 and 608 of Fig 6, col 10, lines 55-67, col 19, lines 17-42, Fig 6).** Therefore it would have been obvious for one of ordinary skill in the art at the time the invention was made to include the method of applying MMSE equalized packet spectrum ratio to establish a peer-to-peer communication between first and second sets in a wireless communication system as taught by Hudson in the system of Boros et al as modified by Tellado et al for establishing a peer-to-peer communication between the first and second subscriber sets in a wireless communication system.

Boros et al, Tellado and Hudson however fail to positively disclose the feature that the communication between the first and second sets of nodes in a wireless communication system is maintained without performing further calibration on the

transmit and receive channels of the subscriber sets. However Keskitalo et al disclosed that the communication between the mobile stations **(Figs 6/7)** can be maintained without performing further calibration on the transmit and receive channels **(col 4, lines 59-67, col 5, lines 1-19)**. Therefore it would have been obvious for one of ordinary skill in the art at the time the invention was made to include the method of applying MMSE equalized packet spectrum ratio to establish a peer-to-peer communication between first and second sets in a wireless communication system as taught by Keskitalo in the system of Boros et al as modified by Tellado and Hudson for establishing a peer-to-peer communication between the first and second subscriber sets in a wireless communication system without performing further calibration on the transmit and receive channels of the subscriber sets. One is motivated as such in order to use the method of peer-to-peer communication to optimize capacity to provide two-way communication between wireless nodes or adjacent cells in wireless network.

One is motivated as such in order to use the method of peer-to-peer communication to optimize capacity to provide two-way communication between wireless nodes or adjacent cells in wireless network.

Regarding claims 41,29,32, Boros et al disclosed a method for communication in a wireless system **(Fig 1),** comprising: calibrating one or more communication links between a plurality of user stations **(subscriber units, items 141 of Fig 1)** and one or more access points **(base station, item 101 of Fig 1),** based on one or more sets of correction factors **(calibration vectors)** derived from estimates of channel responses associated with the one or more communication links **(col 14, lines 30-47),** the plurality

of user stations including a first user station **(item 141 of Fig 1)** and a second user station **(item 143 of Fig 1, col 13, lines 47-65);** and establishing communication between the first and second user stations using steering without performing further calibration between the first and second user stations using weighted average calibration vector **(average calibration vector, col 14, lines 35-60)**; wherein establishing the communication between the first and second user stations comprises: sending, from the first user station a pilot request to establish a communication link with the second user station **(col 12, lines 46-52)**; sending, from the second user station, a steered pilot and an acknowledgment in response to receiving the pilot and the request from first user station; and transmitting information between the first and second user stations using steering based on the steered pilot **(using uplink and downlink spatial signatures col 20, lines 40-58, Fig 7)**. Boros et al disclosed an uplink and downlink spatial signature method (steering pilot) for calibrating to establish communication between the subscriber units but fails to positively disclose using a pilot signal for calibration. However, Tellado et al disclosed a method for multiple transmit/receive pairs that establishes communication **(calibrate channel by determining noise and distortion reference statistics performed over a plurality of time intervals, para 0026-0032, 0080-0081)** between first and second sets of nodes in a wireless communication system **(wireless communications between at least two devices para 0043-0046, Figs 3-4)**. Therefore it would have been obvious for one of ordinary skill in the art at the time the invention was made to include the method of establishing peer-to-peer communication between first and second sets of nodes in a wireless

communication system as taught by Tellado et al in the system of Boros et al for establishing communication between first and second sets of nodes in a wireless communication system on the transmit and receive channels of the subscriber sets. But, both Boros et al and Tellado et al fails to positively disclose the feature of establishing a peer-to-peer between first and second sets in a wireless communication system. However, Hudson et al disclosed a method for calibrating a peer-to-peer communication channel using MMSE equalized packet spectrum ratio between the first and second subscriber stations **(items 620 and 608 of Fig 6, col 10, lines 55-67, col 19, lines 17-42, Fig 6).** Therefore it would have been obvious for one of ordinary skill in the art at the time the invention was made to include the method of applying MMSE equalized packet spectrum ratio to establish a peer-to-peer communication between first and second sets in a wireless communication system as taught by Hudson in the system of Boros et al as modified by Tellado et al for establishing a peer-to-peer communication between the first and second subscriber sets in a wireless communication system.

Boros et al, Tellado and Hudson however fail to positively disclose the feature that the communication between the first and second sets of nodes in a wireless communication system is maintained without performing further calibration on the transmit and receive channels of the subscriber sets. However Keskitalo et al disclosed that the communication between the mobile stations **(Figs 6/7)** can be maintained without performing further calibration on the transmit and receive channels **(col 4, lines 59-67, col 5, lines 1-19)**. Therefore it would have been obvious for one of ordinary skill in the art at the time the invention was made to include the method of applying MMSE

equalized packet spectrum ratio to establish a peer-to-peer communication between first and second sets in a wireless communication system as taught by Keskitalo in the system of Boros et al as modified by Tellado and Hudson for establishing a peer-to-peer communication between the first and second subscriber sets in a wireless communication system without performing further calibration on the transmit and receive channels of the subscriber sets. One is motivated as such in order to use the method of peer-to-peer communication to optimize capacity to provide two-way communication between wireless nodes or adjacent cells in wireless network.

Regarding claims 30-31, 36-37, Boros et al disclosed wherein the request to establish the communication comprises an identifier of a basic service set to which the first user station belongs **(quality estimates for respective subscriber units, col 31, lines 62-67, col 32, lines 1-10)** and an identifier of the first user station **(SUs, col 32, lines 20-35)** and wherein the acknowledgment comprises an identifier of the second user station, an identifier of a basic service set to which the second user station belongs, and a data rate indicator **(indicator Q, col 32, lines 36-51).**

Regarding claims 42,35,38, Boros et al disclosed an apparatus **(Fig 1)** for communication in a wireless system **(Figs 4-7),** comprising: means for calibrating one or more communication links between a plurality of user stations **(subscriber units, items 141 of Fig 1, col 13, lines 47-65)** and one or more access points **(base station, item 101 of Fig 1),** based on one or more sets of correction factors **(calibration vectors)** derived from estimates of channel responses associated with the one or more communication links **(col 14, lines 30-47),** the plurality of user stations including a first

user station **(item 141 of Fig 1)** and a second user station **(item 143 of Fig 1);** means for establishing communication between the first and second user stations using steering **(using single calibration vector, col 14, lines 35-60)**; wherein establishing the communication between the first and second user stations comprises: means for sending, from the first user station a pilot request to establish a communication link with the second user station **(col 12, lines 46-52)**; means for sending, from the second user station, a steered pilot and an acknowledgment in response to receiving the pilot and the request from first user station; and means for transmitting information between the first and second user stations using steering based on the steered pilot **(using uplink and downlink spatial signatures col 20, lines 40-58, Fig 7)**. Boros et al disclosed an uplink and downlink spatial signature method (steering pilot) for calibrating to establish communication between the subscriber units but fails to positively disclose using a pilot signal for calibration. However, Tolledo et al disclosed a method of performing calibration using a pilot signal at the receiver to establish communication between the transmitter and the receiver **(receiver estimates the transmitted information by using pilot signal calibration, para 0080-0082, Fig 6).** Therefore it would have been obvious for one of the ordinary skill in the art at the time the invention to include the method of performing calibration using a pilot signal at the receiver to establish communication between the transmitter and the receiver as taught by Tolledo et al in the system of Boros et al by sending, from the second user station, a steered pilot and an acknowledgment in response to receiving the pilot and the request from first user

station; and transmitting information between the first and second user stations using steering based on the steered pilot.

Boros et al, Tellado and Hudson however fail to positively disclose the feature that the communication between the first and second sets of nodes in a wireless communication system is maintained without performing further calibration on the transmit and receive channels of the subscriber sets. However Keskitalo et al disclosed that the communication between the mobile stations **(Figs 6/7)** can be maintained without performing further calibration on the transmit and receive channels **(col 4, lines 59-67, col 5, lines 1-19)**. Therefore it would have been obvious for one of ordinary skill in the art at the time the invention was made to include the method of applying MMSE equalized packet spectrum ratio to establish a peer-to-peer communication between first and second sets in a wireless communication system as taught by Keskitalo in the system of Boros et al as modified by Tellado and Hudson for establishing a peer-to-peer communication between the first and second subscriber sets in a wireless communication system without performing further calibration on the transmit and receive channels of the subscriber sets. One is motivated as such in order to use the method of peer-to-peer communication to optimize capacity to provide two-way communication between wireless nodes or adjacent cells in wireless network.

6. Claims 25, 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mesecher et al [US Pat: 6,278,726] and Keskitalo et al. [US Pat: 7,403,748] further in view of Hudson [US Pat: 7,254,171].

Regarding claims 25,27, Mesecher et al disclosed a user terminal in a wireless time division duplexed (TDD) communication system , comprising: a transmit (TX) spatial processor (**transmitting circuit, Figs 14-15)** operative to transmit a first pilot on an uplink channel **(col 6, lines 5-22);** a receive (RX) spatial processor operative **(receiving circuit, Fig 17)** to receive a second pilot on a downlink channel and derive an estimate of a downlink channel response based on the received second pilot **(col 6, lines 23-27)**, and to receive an estimate of an uplink channel response derived based on the transmitted first pilot **(col 6, lines 41-67, Figs 18-19)**; and a controller operative to determine first and second sets of correction factors based on the estimates of the downlink and uplink channel responses **(col 7, lines 1-15, Figs 20-21)**, wherein a calibrated downlink channel is formed by using the first set of correction factors for the downlink channel and a calibrated uplink channel is formed by using the second set of correction factors **(vector correlators)** for the uplink channel **(col 7, lines 16-31),** and to determine the first and second sets of correction factors based on a minimum mean square error computation **(MMSE, col 7, lines 32-37)**. Mesecher et al disclosed a method for spatial processing of steering pilots to calibrate uplink and downlink channels to establish communication between the subscriber units but fails to positively disclose using spatial processors to transmit pilot signal and receive pilot signals on uplink and downlink channel respectively for calibration of the channels. However, Keskitalo et al disclosed the feature of using pilot signals for performing calibration **(Fig 3,lines 8-67, col 9, lines 1-23)**. Therefore it would have been obvious for one of the ordinary skill in the art at the time the invention was made to use the feature of disclose

using spatial processors to transmit pilot signal and receive pilot signals on uplink and downlink channel respectively for calibration of the channels as taught by Keskitalo et al in the system of Mesecher et al to include spatial processors to transmit pilot signal and receive pilot signals on uplink and downlink channel. However both Mesecher and Keskitalo fail to disclose wherein the controller is further operative to determine the first and second sets of correction factor based on a matrix-ratio computation to establish communication between first and second sets in a wireless communication system. However, Hudson et al in disclosed a method for the controller **(processor, item 150 of Fig 1, col 8, lines 52-60)** to determine the first and second sets of correction factor based on a matrix-ratio computation using MMSE equalized packet spectrum ratio between the first and second subscriber stations **(items 620 and 608 of Fig 6, col 10, lines 1-67, col 19, lines 17-42, Fig 6).** Therefore it would have been obvious for one of ordinary skill in the art at the time the invention was made to include the method of applying MMSE equalized packet spectrum ratio to establish a peer-to-peer communication between first and second sets in a wireless communication system as taught by Hudson in the system of Mesecher et al as modified by Keskitalo to establish communication between the first and second subscriber sets in a wireless communication system without performing on calibration on the transmit and receive channels of the subscriber sets. One is motivated as such in order to use the method of peer-to-peer communication to optimize capacity to provide two-way communication between wireless nodes or adjacent cells in wireless network.

Allowable Subject Matter

7. Claims 33, 39 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

8. Applicant's argument, see remarks filed on 12/08/2009 with respect to rejection of claims 1-42 have been fully considered but is moot in view of new ground(s) of rejection.

Conclusion

9. Any inquiry concerning this communication or earlier communications should be directed to the attention to Venkatesh Haliyur whose phone number is 571-272-8616. The examiner can normally be reached on Monday-Friday from 9:00AM to 5:00 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner’s supervisor, Ayaz Sheikh can be reached @ 571-272-3795. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the group receptionist whose telephone number is (571)-272-2600 or fax to 571-273-8300.

10. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197(toll-free).

/Venkatesh Haliyur/

Examiner, Art Unit 2476

/Ayaz R. Sheikh/

Supervisory Patent Examiner, Art Unit 2476